

1/15

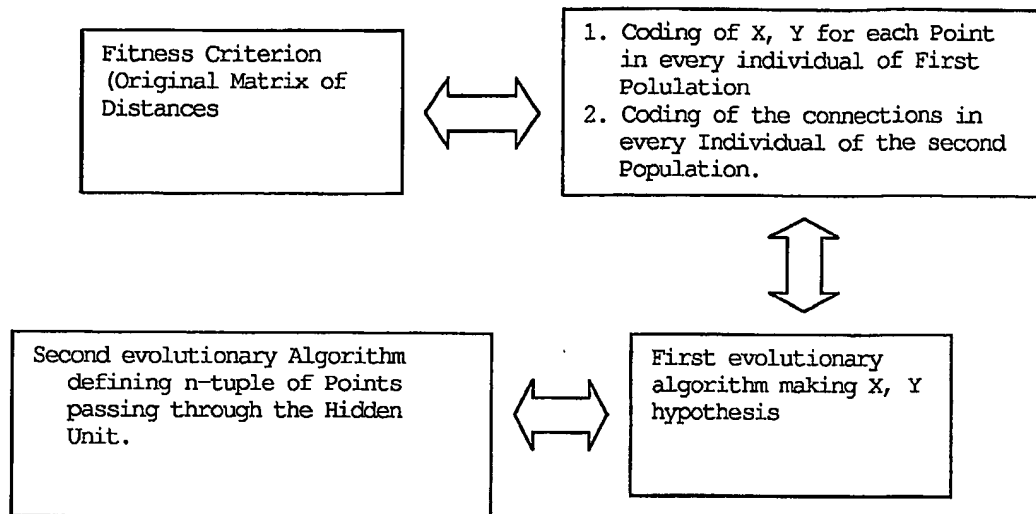


Fig. 1

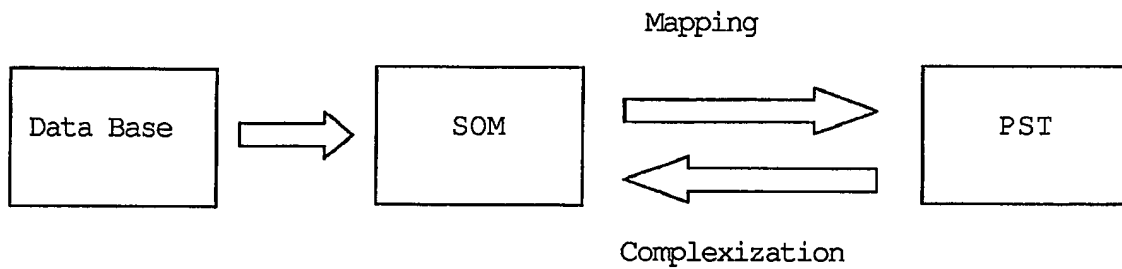


Fig. 2

2/15

Example (1)

HIDDEN

	Hidden									
	Alessandria	Ancona	Aosta	Arezzo	Ascoli	Asti	Avellino	Bari	Belluno	Benevento
Alessandria	0									
Ancona	465	0								
Aosta	165	617	0							
Arezzo	389	192	550	0						
Ascoli	576	122	728	249	0					
Asti	37	491	159	420	602	0				
Avellino	824	437	985	456	365	855	0			
Bari	919	465	1071	661	400	945	208	0		
Belluno	441	454	534	426	565	468	861	908	0	
Benevento	805	395	966	431	323	836	42	197	842	0

Highway Distances in a geographic space between 10 Italian Cities (in Km)
Every highway has three types of alteration in a 2D Euclidean space:

- 1) A longitudinal alteration
- 2) An altitude alteration:
- 3) A structural alteration

Fig. 3

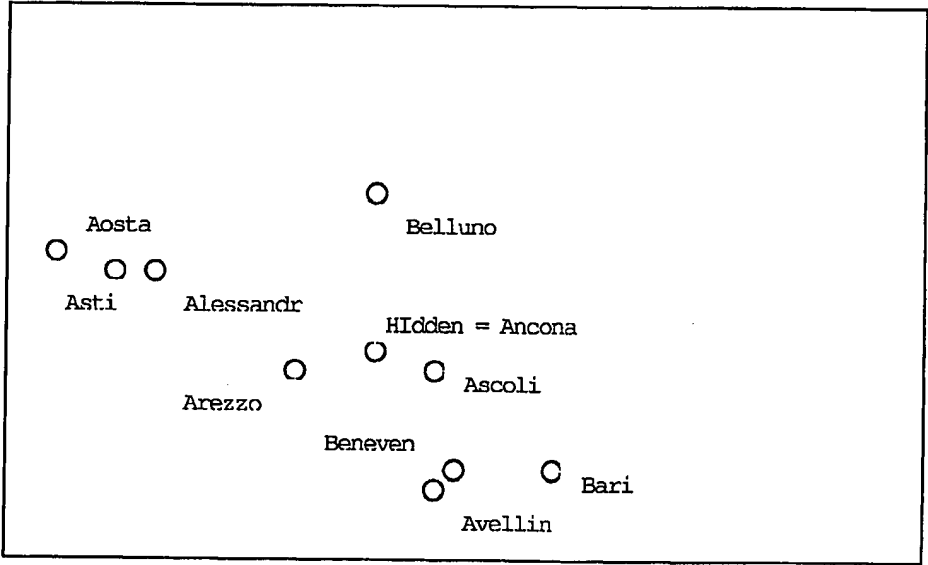


Fig. 4

3/15

Example (2)

	LA	NY	BOSTON	DETROIT	BUFFALO	PITTSBURG	CHICAGO	SAINT_LOUIS	CINCINNATI	DALLAS	ATLANTA	MEMPHIS
LA	0											
NY	5600	0										
BOSTON	6109	509	0									
DETROIT	4582	1145	1527	0								
BUFFALO	5091	764	1018	509	0							
PITTSBURG	4836	764	1145	509	382	0						
CHICAGO	4073	1655	2036	509	1018	891	0					
SAINT_LOUIS	3564	2036	2418	1018	1527	1273	636	0				
CINCINNATI	4327	1273	1655	382	764	509	509	764	0			
DALLAS	2800	2927	3436	2036	2545	2291	1655	1018	1782	0		
ATLANTA	4327	1527	2036	1145	1400	1018	1145	1018	764	1527	0	
MEMPHIS	3564	2164	2545	1273	1782	1400	1018	382	891	891	764	0

Flight Distances in a geographic space between 12 USA Cities (in miles)
 Every air route has three types of alteration in a 2D Euclidean space:

- 1) A longitudinal alteration
- 2) An altitude alteration:
- 3) A structural alteration

Fig. 5

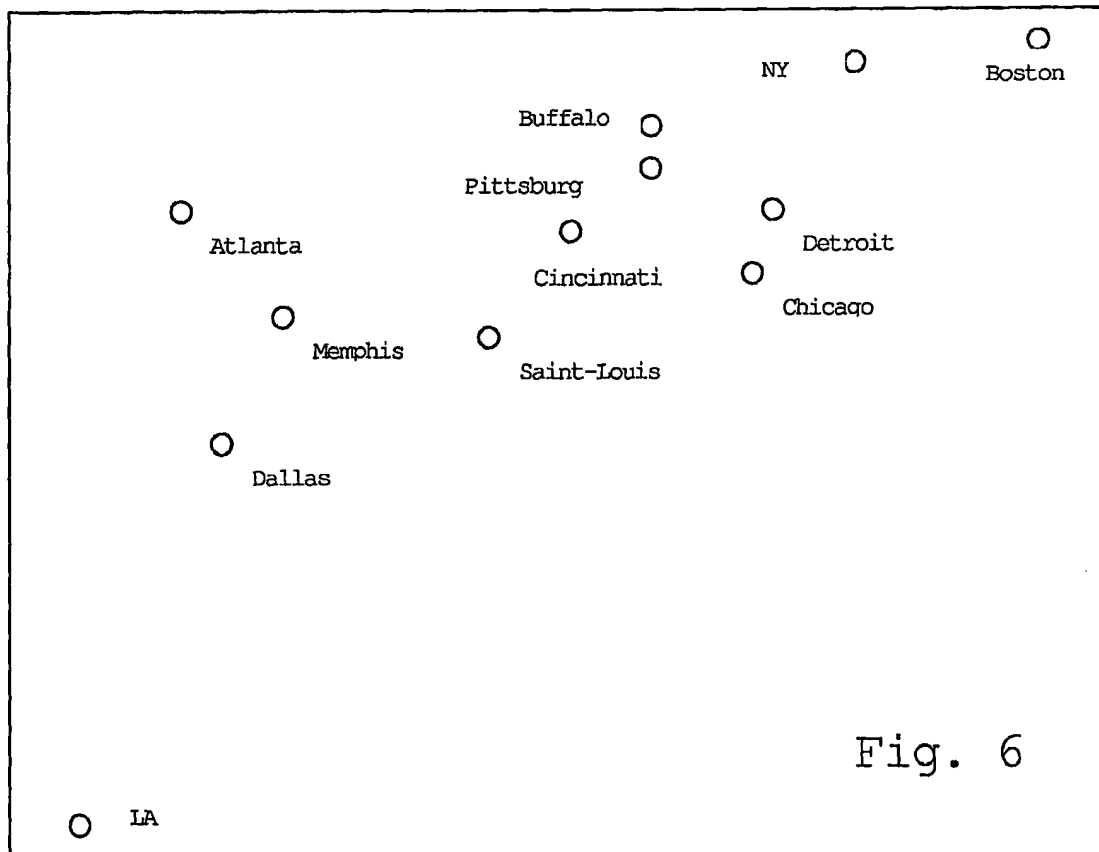


Fig. 6

Example 3

	Cereals	Rice	Potatoes	Sugar	Vegetables	Meat	Milk	Butter	Eggs
Belgium	72,2	4,2	98,8	40,4	103,2	102	80	7,7	14,2
Denmark	70,5	2,2	57	39,5	50	105,8	145,2	4,1	14,3
Germany	71,3	2,3	74,1	37,1	83,1	97,2	90,7	6,9	14,8
Greece	109,8	5,4	90	30	229,5	77,1	63,1	0,9	11,3
Spain	71,4	5,8	107,8	26,8	191,7	102,1	98,4	0,6	15,3
France	73	4,3	78,2	34,1	95	110,5	98,9	8,9	15
Ireland	93,4	3,2	151,5	34,8	55	105	185,9	3,4	11,4
Italy	110,2	4,8	38,6	27,9	181,9	88	65	2,4	11,1
Netherlands	54,6	5	86,7	39,7	99	89,4	136,2	5,4	10,7
Portugal	86	5,7	106,6	29,4	100	75,5	96	1,5	7,7
Gr.Britain	74,3	4,5	94,1	39,8	60	74,4	129,3	3,2	10,8
Austria	68,7	4,2	62,6	37,1	81,9	93,4	121,3	4,3	13,4
Finland	70,1	5,4	61,6	35,7	52,6	65	208,4	5,8	10,9
Island	79,7	1,9	50,2	54,9	50	71,7	205,6	4,6	11,3
Norway	76,9	3,5	73,2	37,3	48,3	54,9	176,5	2,1	11,3
Sweden	69,3	4,3	70	37,5	48,5	60,5	154,1	5,7	12,9

European
Countries
Food
Consumption in
1994:

9 variables
16
observations

5/15

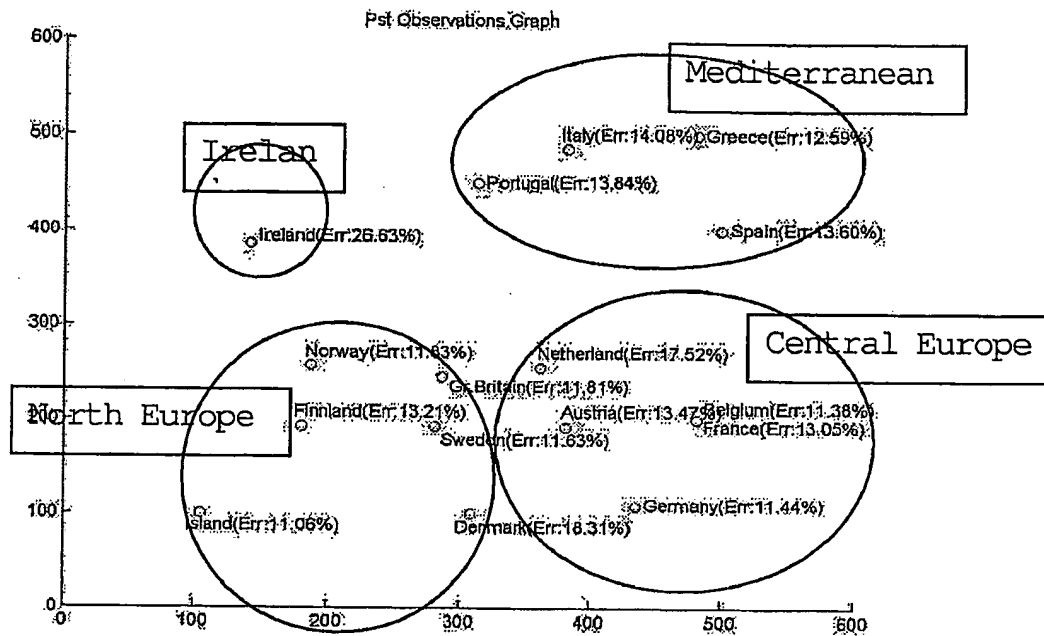


Fig. 8

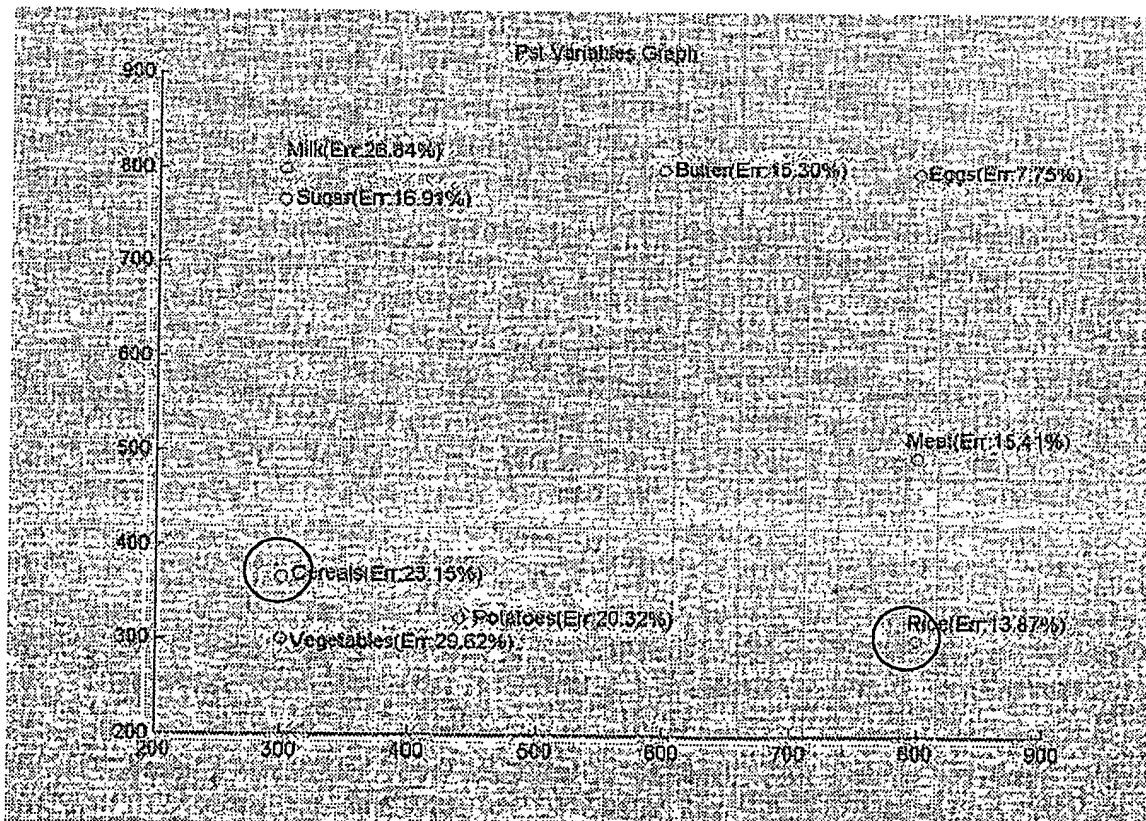


Fig. 9

6/15

Variables		Complement
1	AgeExam	1-AgeExam
2	AgeDeath	1-AgeDeath
3	EdYears	1-EdYears
4	ADL	1-ADL
5	WRCL	1-WRCL
6	CNPR	1-CNPR
7	BOST	1-BOST
8	VRBF	1-VRBF
9	MMSE	1-MMSE
10	TangleNeocortex	1-TangleNeocortex
11	TangleHippo	1-TangleHippo
12	PlaqueNeocortex	1-PlaqueNeocortex
13	PlaqueHippo	1-PlaqueHippo

Fig. 10

8/15

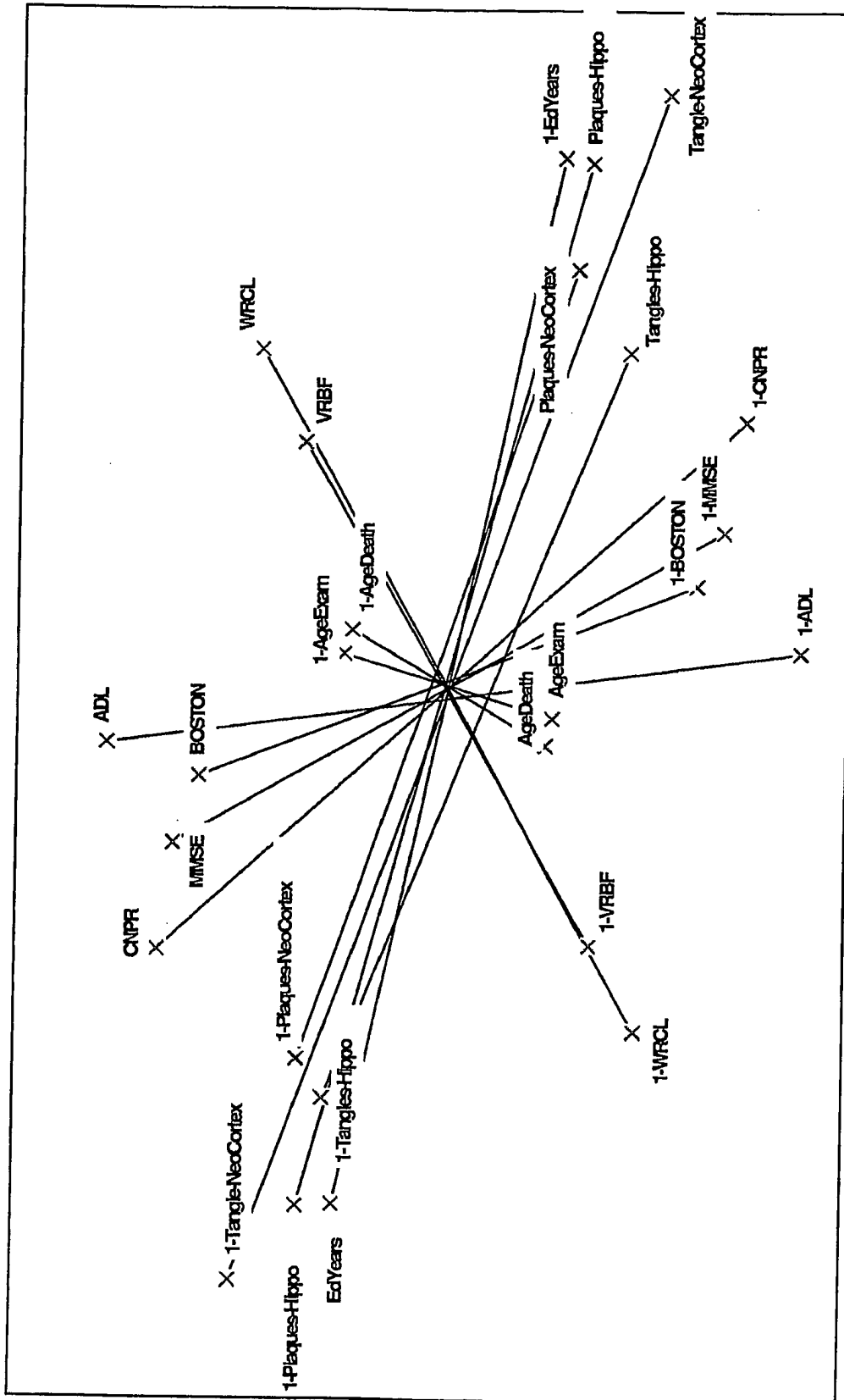
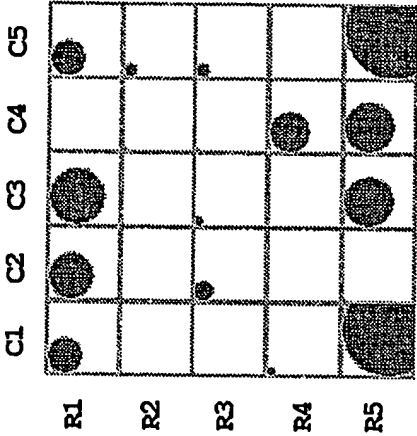


Fig. 12

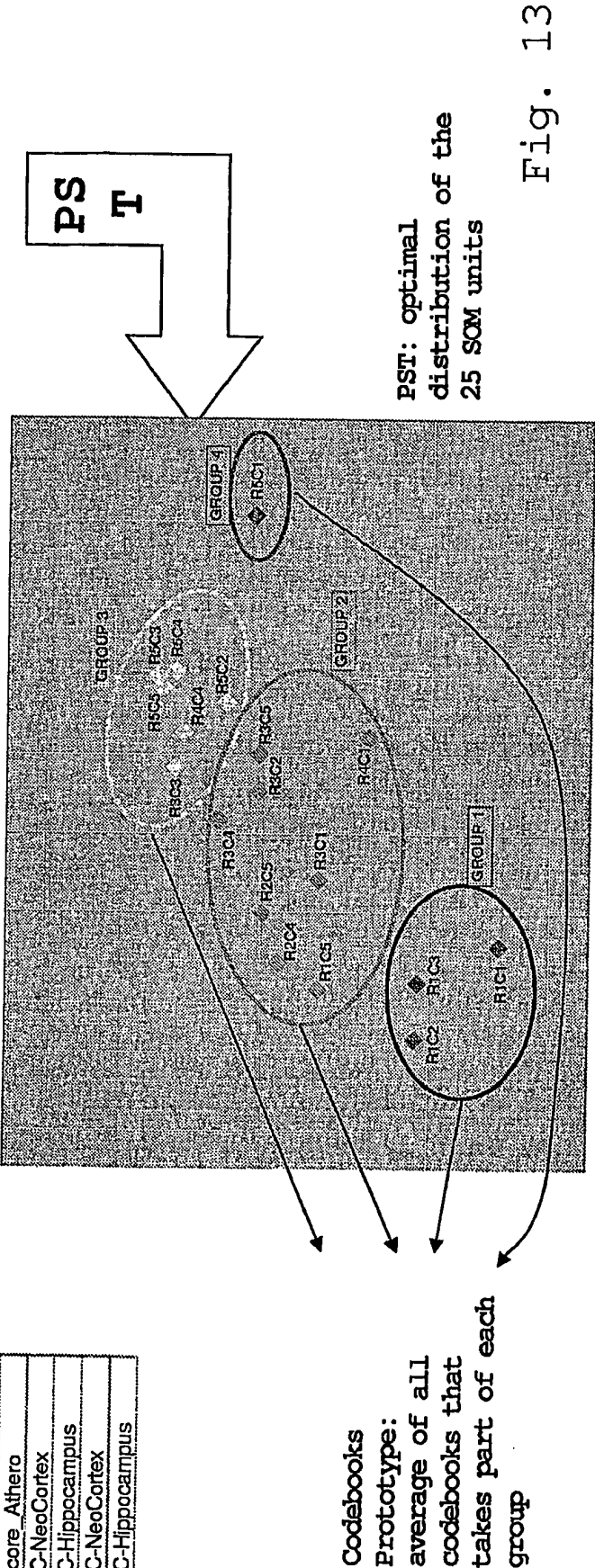
Explorative hypothesis of Natural Clustering : Procedure

Variables
Age_last_exam
Age_death
Education_Years
Walk
Dress
Stand
Toilet
Eat_Drink
WRCL
CNPR
BOSTON
VRBF
MMSE
Apolipoprotein_E4
Score_Athero
TC-NeoCortex
TC-Hippocampus
PC-NeoCortex
PC-Hippocampus

Self-Organizing Maps (SOM)



Distribution of Subjects in a SOM Map (25 units)



Codebooks
Prototype:
average of all
codebooks that
takes part of each
group

Fig. 13

10/15

Explorative hypothesis of Natural Clustering

Codebooks Prototype of each Group

Variables	Group-1	Group-2	Group-3	Group-4
Age_last_exam	90,7579	89,3621	84,9923	88,1756
Age_death	91,4622	90,1110	86,0971	89,1812
Education_Years	14,5917	14,2293	15,2572	16,0271
Walk	0,0605	0,5899	0,9713	0,9768
Dress	0,0453	0,4409	0,9791	0,9466
Stand	0,0652	0,5912	0,9913	1,0000
Toilet	0,0041	0,1725	0,9560	0,9780
Eat_Drink	0,0280	0,6173	0,8813	0,9347
WRCL	0,2860	2,2480	5,3737	3,4404
CNPR	2,5170	8,0884	9,5579	9,6409
BOSTON	3,1969	9,4987	11,8490	10,6115
VRBF	1,9532	7,3083	12,2307	12,5998
MMSE	4,7406	17,5601	25,7396	23,2561
Apolipoprotein_E4	0,3323	0,1622	0,0076	0,8658
Score_Athero	0,4845	0,4546	0,3899	0,5456
TC-NeoCortex	15,5941	7,7160	0,9555	7,2049
TC-Hippocampus	39,0581	33,3978	11,9865	31,9796
PC-NeoCortex	8,2940	5,7019	3,6005	6,3076
PC-Hippocampus	4,0608	3,0796	0,9535	5,1484
Number of subjects	27	22	50	18
Number of Demented	25	14	6	1
Demented in %	92,59%	63,64%	12,00%	5,56%
Number of MCI	1	6	15	7
MCI in %	3,70%	27,27%	30,00%	38,89%

Unsupervised
Organisms

Fig. 14

11/15

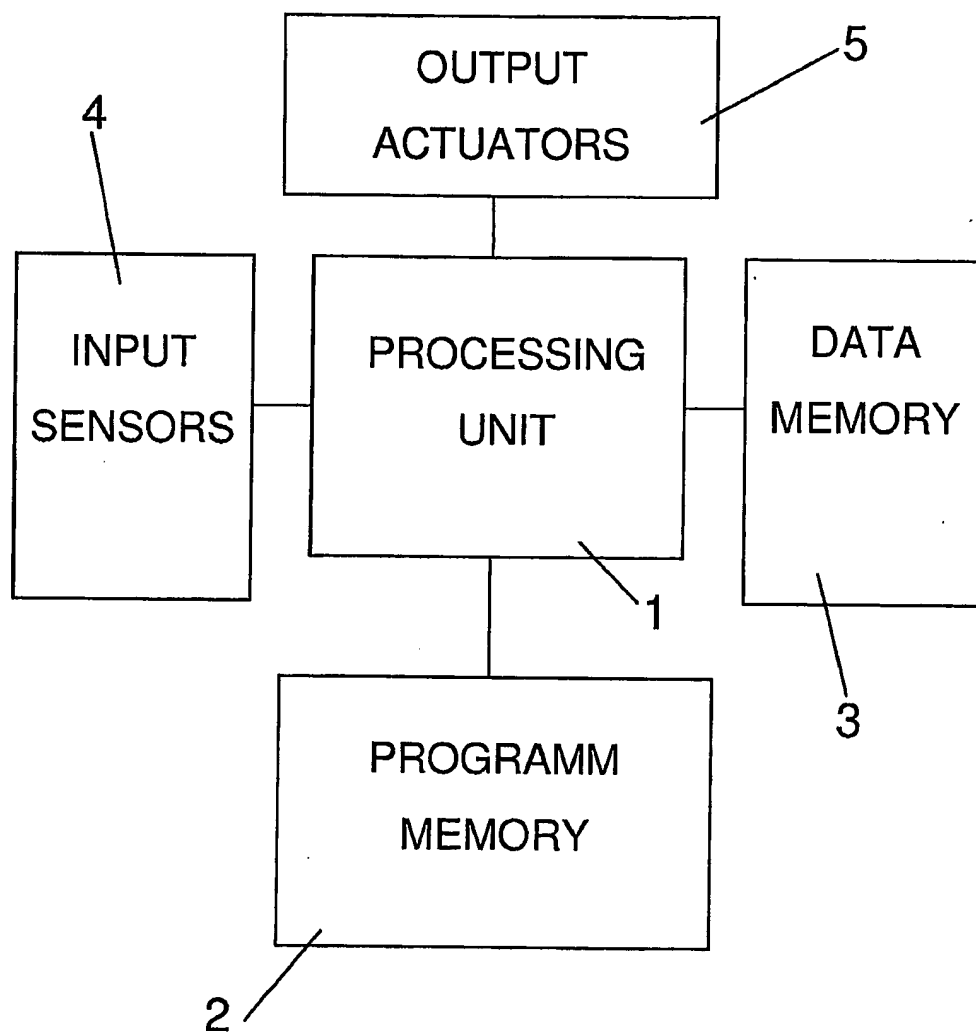


Fig. 15

12/15

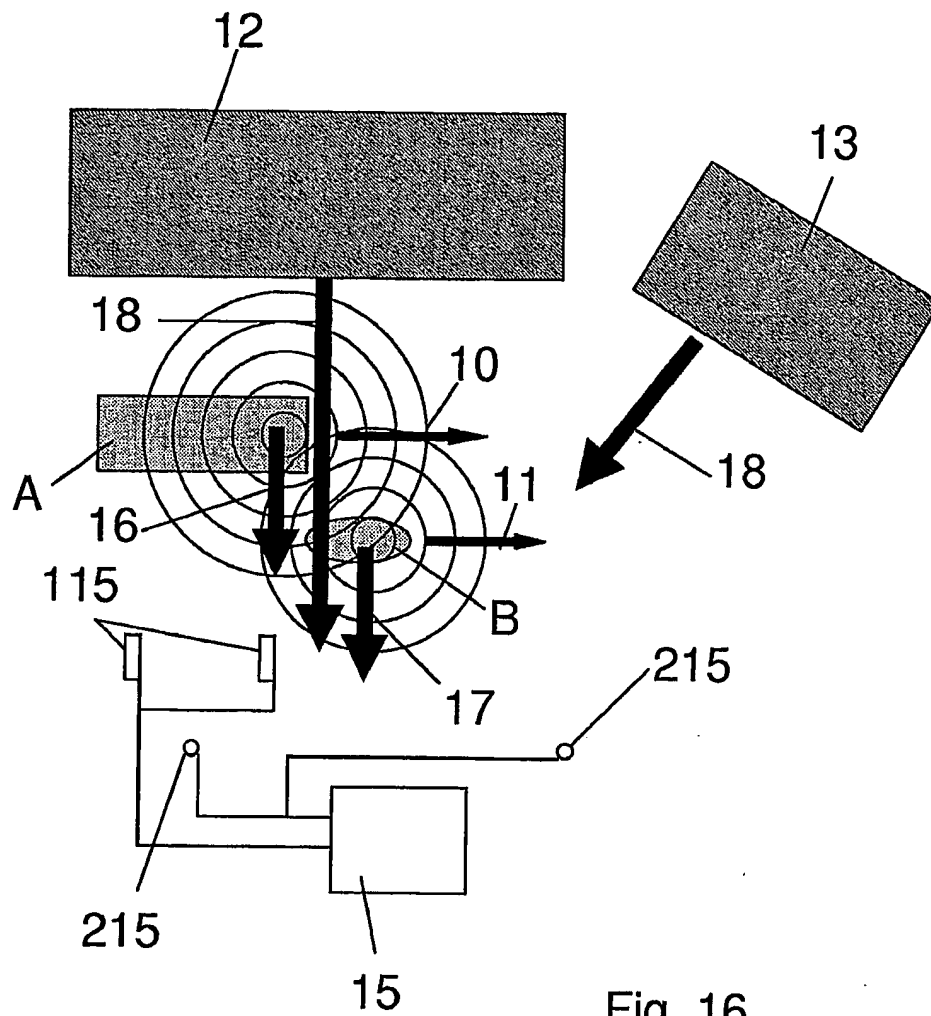


Fig. 16

13/15

Distances between atoms ((-1) indicates lacking information about distances)

AL1	AL2	AL3	AL4	AL5	AL6	AL7	AL8	AL9	AL10	AL11	AL12	AL13	AL14	AL15	AL16	AL17	AL18	AL19	AL20	AL21	AL22	AL23	AL24	AL25
0	-1	-1	480	-1	-1	-1	-1	-1	-1	-1	220	407	-1	-1	-1	688	-1	-1	-1	636	-1	-1	-1	-1
-1	0	-1	-1	265	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	188	-1	-1	-1	-1	-1	-1	-1	-1
-1	-1	0	-1	474	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	307	-1	-1	-1	-1	-1	-1	-1	-1
480	-1	-1	0	238	-1	-1	-1	-1	-1	-1	670	-1	-1	-1	-1	-1	-1	-1	400	554	-1	-1	572	-1
-1	265	474	238	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	350	-1
-1	-1	-1	-1	0	-1	247	-1	-1	-1	-1	-1	528	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
-1	-1	-1	-1	-1	-1	0	168	-1	-1	-1	-1	-1	144	-1	-1	-1	-1	-1	194	376	-1	-1	-1	179
-1	-1	-1	-1	-1	-1	247	168	0	-1	-1	-1	-1	222	-1	-1	-1	418	-1	-1	-1	-1	-1	-1	-1
-1	-1	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	160	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
-1	-1	-1	-1	-1	-1	-1	-1	-1	0	289	-1	463	-1	-1	-1	-1	-1	-1	320	123	-1	-1	-1	-1
-1	-1	-1	-1	-1	-1	-1	-1	-1	289	0	-1	-1	-1	-1	-1	-1	692	-1	-1	-1	-1	-1	-1	218
220	-1	-1	670	-1	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
407	-1	-1	-1	-1	-1	528	-1	-1	463	-1	0	-1	-1	515	-1	695	-1	-1	-1	-1	-1	-1	-1	-1
-1	-1	-1	-1	-1	-1	-1	-1	160	-1	-1	-1	0	-1	286	-1	-1	-1	383	-1	-1	-1	-1	-1	-1
-1	-1	-1	-1	-1	-1	144	222	-1	-1	-1	-1	-1	0	220	548	-1	-1	-1	-1	-1	-1	-1	-1	-1
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	515	286	220	0	-1	-1	-1	-1	521	-1	-1	-1	-1	-1
-1	307	-1	-1	-1	-1	-1	-1	79	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
-1	688	188	-1	-1	-1	-1	-1	-1	-1	-1	-1	895	-1	-1	-1	0	716	543	-1	-1	-1	913	-1	-1
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	692	-1	-1	-1	-1	-1	716	0	-1	-1	-1	-1	-1	-1	-1
-1	-1	-1	-1	-1	-1	-1	-1	-1	320	-1	-1	383	-1	-1	-1	543	-1	0	250	-1	-1	-1	614	584
-1	-1	-1	400	-1	-1	-1	-1	-1	123	-1	-1	-1	-1	-1	-1	-1	-1	250	0	-1	-1	-1	-1	-1
636	-1	554	-1	-1	-1	194	-1	-1	-1	-1	-1	-1	-1	-1	521	-1	-1	-1	-1	0	-1	-1	-1	-1
-1	-1	-1	-1	-1	-1	376	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	-1	353	-1	-1
-1	-1	-1	-1	-1	-1	-1	-1	637	236	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	403	-1	-1
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	913	-1	-1	-1	-1	353	403	0	-1	-1
-1	-1	-1	572	350	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	-1
-1	345	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0

Fig. 17

14/15

TWO DIMENSIONAL MAP

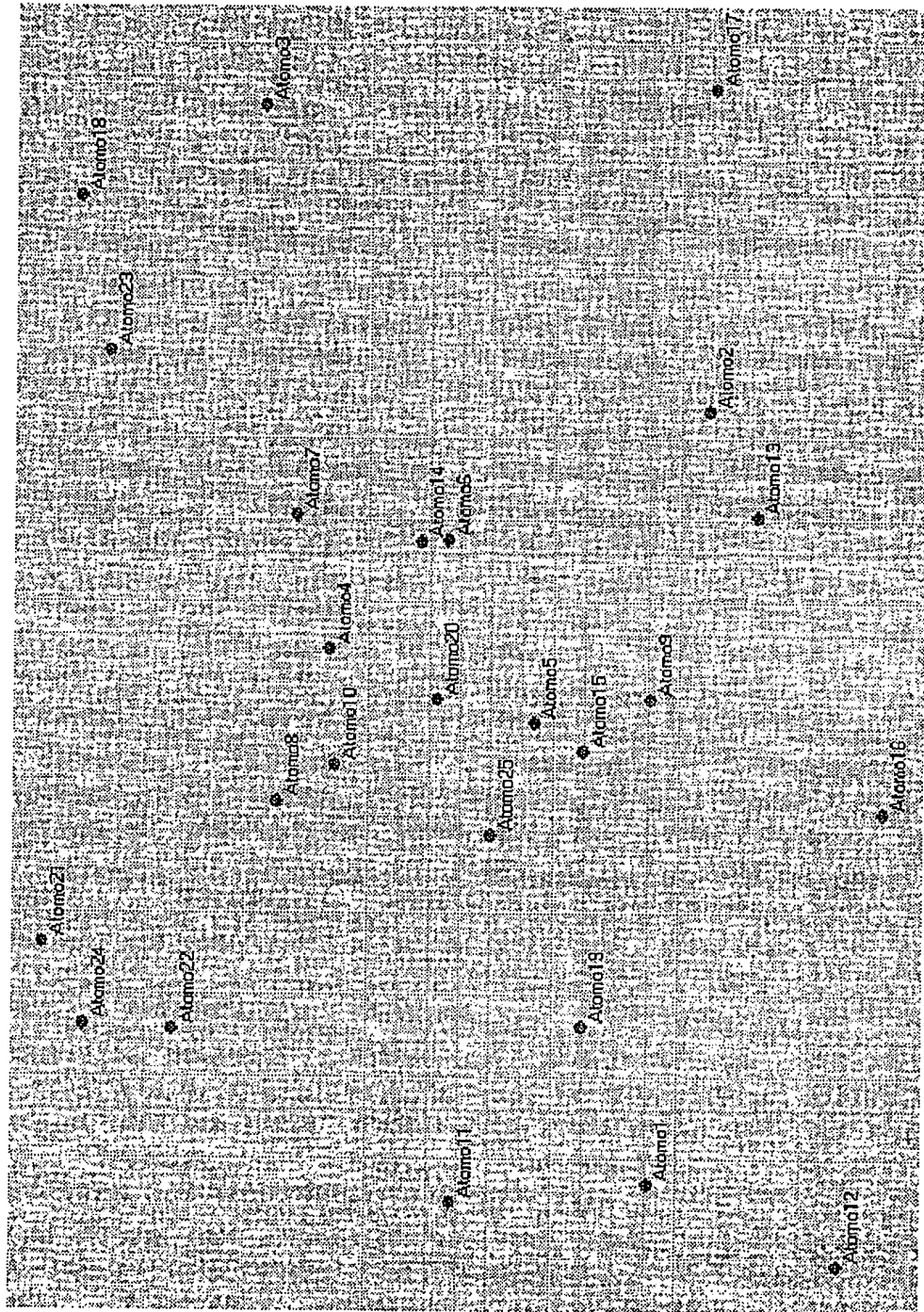


Fig. 18

15/15

THREE DIMENSIONAL MAP

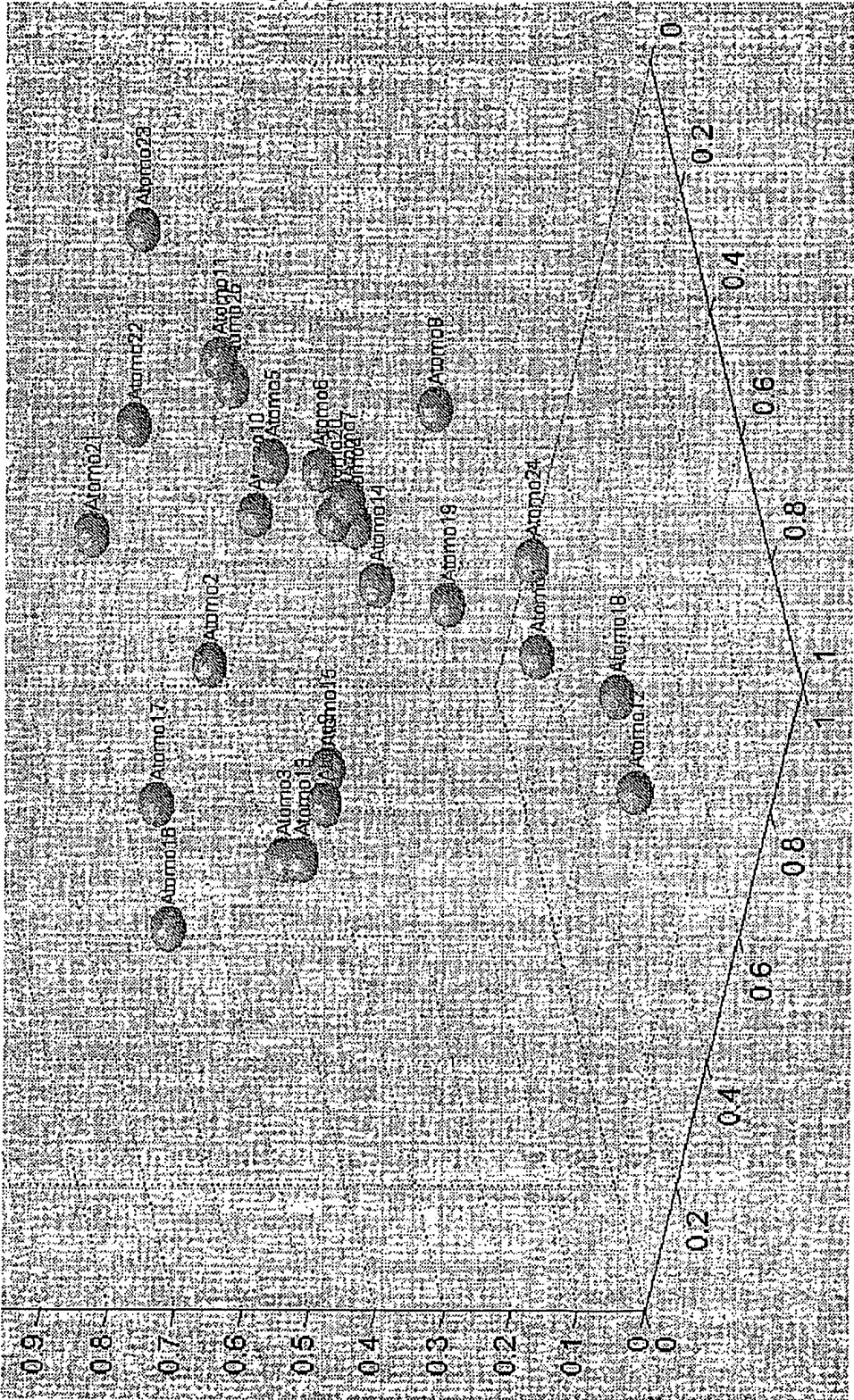


Fig. 19